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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,582	07/31/2000	Christopher L. Hamlin	K35A0648	5196

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WESTERN DIGITAL CORP.
20511 LAKE FOREST DRIVE
C205 - INTELLECTUAL PROPERTY DEPARTMENT
LAKE FOREST, CA 92630

EXAMINER

BATES, KEVIN T

ART UNIT	PAPER NUMBER
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2155

DATE MAILED: 07/17/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/628,582

Applicant(s)

HAMLIN, CHRISTOPHER L.

Examiner

Kevin Bates

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____ .
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ .
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____ .
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____ .

DETAILED ACTION

Claims 1-11 are pending in this Office Action.

Information Disclosure Statement

The information disclosure statement file in Paper No. 4 on November 9, 2000 has been considered.

Specification

The disclosure is objected to because of the following informalities: on page 3, line 13 the word 'the' should be removed. Appropriate correction is required

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-2, 5, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihori (5,996,014) in view of Thorson (6,055,618).

Regarding claim 1, Uchihori discloses a distribution video server system that comprises a shared disk array, a plurality of element servers (which interface with the shared disk array), a shared channel network, a communication network, and a plurality of clients (column 5, line 32). The communication network that described in column 6 line 15, can be a ATM network, which is essentially a switched fabric, including bi-directional ports to allow the communication transfer between the servers and the hosts. Uchihori also discloses a Master scheduler, the server control unit for the scheduling of the servers, it is seen in figure 9 step 90 and described in column 12, line 37. Uchihori discloses the both scheduling data communicated between the servers, and the requests from the clients, but does not explicitly indicate the

idea of priority between the scheduling data and scheduled requests. Thorson teaches in his switched network where the maintenance information that is described in column 1, line 24 as system configuration and hardware monitoring which can be considered as the data necessary for scheduling. In the abstract Thorson discloses that the scheduling data has higher priority than the normal traffic. Having maintenance data having priority means that it does not need its own physical network, which reduces the complexity of the system (Column 1, line 30) and the scheduling data still is always given access to the physical communication links (Column 9, line 30). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Thorson teachings of enabling the scheduling data to be able to use the same communication lines as scheduled requests while making sure the scheduling data is always the highest priority of the system.

Regarding claim 2, Uchihori discloses a shared channel network as the connection between the servers and the disk storage drives. He additionally notes that this channel network maybe a loop connection, bus, or fabric (Column 6, line 12).

Regarding claim 5, Uchihori does not explicitly specify and type of communication method for the scheduled requests and the scheduling data. Thorson teaches in column 2, line 62 that virtual channels, or virtual lanes can be used to avoid deadlock, to reduce network congestion for normal traffic, and to block packets in separate virtual channels from being blocked. He also uses virtual channels in his invention as the method of creating the priority of his scheduling data. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Thorson's virtual lanes in Kiyohiro's storage system for so that the scheduling data could be given priority over scheduled requests, and also to avoid deadlocks and reduce congestion for the scheduled requests.

With respect to claim 7 see the rejection of claim 1.

With respect to claim 10 see the rejection to claim 5.

Claims 3-4, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihori in view of Thorson as applied to claims 1-2, 5, 7, and 10 above, and further in view of Chen (5,787,482).

Regarding claims 3 and 4, Uchihori discloses a storage system, but does not explicitly mention scheduling methods for scheduled requests within the disk controller. Chen teaches about a disk access

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scheduler that increases disk utilization (Column 5, line 23) by keeping a sorted queue of deadline, but also scans from the path of the current arm location to the next most urgent request it encounters another disk request it handles that request before the next in the priority queue (Column 8, line 46). The term path refers to the radial movement of the head and also the circumferential movement of the disk. Using that information reduces the disk access delay that normal disk requests usually experience. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to optimize the data storage device utilization by using Chen's teaching of scheduling requests in accordance to the movement and position of the head and the disk in Uchihori disk storage system in order to reduce disk access time overall.

Regarding claims 8 and 9, see the rejection to claims 3 and 4.

Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihori in view of Thorson as applied to claim 1-2, 5, 7, and 10 above, and further in view of Darnell (6,381,647).

In regards to claim 6, Uchihori discloses a storage system with the characteristics listed above and a master scheduler, which synchronizes the operations of all the interfaces, but it does not explicitly mention the protocol for scheduling data transmissions. Darnell teaches about a method of scheduling data in switched fabric. He discloses using isochronous frames that are initiated at a periodic rate to and from a master node or the acting control unit (Column 4, line 29). He also tells that the advantage of using these isochronous frames have many technical advantages, including using the bandwidth when it is not needed for the isochronous frames for aperiodic frames such as the scheduled requests (Column 2, line 33). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Darnell's improvement of transferring periodic scheduling data within a switched network on the storage system in order to achieve the synchronized operations mentioned in Uchihori's system and keep the bandwidth available during the times where scheduled data is not needed to be sent for the scheduled requests.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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U. S. Patent No. 6496899 issued to DeMoney

U. S. Patent No. 6545978 issued to Kenichi

U. S. Patent No. 6148414 issued to Brown


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Bates whose telephone number is (703) 605-0633. The examiner can normally be reached on 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (703) 308-6662. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

KB
kb
July 14, 2003


HOSAIN T. ALAM
PRIMARY EXAMINER